IN THE CLAIMS

Amend the claims as follows:

1. (Currently amended) ~~Method~~ A method for ~~the two-dimension~~ dimensional separation of mixtures of biomolecules or other substances ~~mixtures in~~ wherein the biomolecules comprise a solution or an amount of a gel material comprising the biomolecules ~~gels, polymer carriers by means of electrophoresis~~ in an electrophoresis apparatus permitting simultaneous use of two chambers for preparing and performing electrophoresis of two two-dimensional gels , ~~where~~ the method comprising

~~the gels~~ casting a first gel for the separation in the first dimension ~~and the gels~~ and casting a second gel for the separation in the second dimension, wherein the first gel and second gel are arranged in succession or simultaneously vertical to one another, wherein casting the first gel and second gel are performed within ~~are brought into~~ an electrophoresis combination chamber, ~~as casting gels or as ready-to-use gels~~ and the first gel is ~~from each other are isolated~~ separated from the second gel by a hollow seal, ~~polymerised and re-hydrated respectively~~,

- adding buffer solution ~~are then filled in~~, followed by adding a biomolecule mixture that is deposited onto the ~~gels~~ first gel ~~of the first dimension~~ and the electrophoretic separation ~~of~~ in the first dimension is carried out at constant temperature or at a fixed temperature gradient,

- removing the buffer solution and the hollow seal ~~is then suctioned off, the isolation neutralised~~ and adding a~~,~~ contact gel solution ~~is filled into the resulting spaces~~ between the first gel and second gel ~~dimension and polymerised out~~, wherein after the contact gel solution polymerizes buffer solutions are filled in and the electrophoretic separation ~~of~~ in the second dimension is carried out at a precisely set temperature and constant electric capacity or increasing current intensity, and

~~finally,~~ terminating electrophoresis and developing the gels ~~are developed and~~ to localize the positions of the ~~proteins~~ biomolecules. ~~are made visible by standard methods.~~

2. (Currently amended) Method according to Claim 1, wherein,

~~for~~ the ~~separation process~~ first and second gels in the electrophoresis combination chamber are standing vertically and the separation of the proteins is performed in the first dimension vertically and in the second dimension horizontally.

3. (Currently amended) Method according to Claim 1, wherein

~~the gels~~ the first gel of the first dimension ~~are~~ is cast as a flat ~~gels~~ gel in a U-shaped tube, in which case a stop gel is first cast and, following this, the ~~separation~~ second gel is cast and wherein the gels are cast and polymerized ~~the casting processes as well as the polymerisation processes take place~~ at constant temperature with ~~activated~~ cooling.

4. (Currently amended) Method according to Claim 1 wherein

~~the gels of the second dimension are~~ a sealing gel is and cast ~~in two steps in such a way that, in a first step a sealing gel, and after its polymerisation,~~ allowed to polymerize, wherein ~~in a second step~~ the second gel ~~solution is~~ cast from ~~below and rising~~ bottom to top ~~in an upward direction in such a way that the air is displaced upwardly~~ and ~~the gel is finally~~ polymerised at constant temperature with ~~activated~~ cooling.

5. (Currently amended) Method according to Claim 1 wherein

the first and second gels are produced with ~~variable~~ different widths and thicknesses.

6. (Canceled)

7. (Canceled)

8. (Canceled)

9. (Currently amended) Device for the two-dimensional separation of biomolecules or other substance mixtures in gels by means of electrophoresis in an electrophoresis apparatus ~~indicating~~ comprising electrodes,

wherein

an electrophoresis combination chamber (1) ~~has~~ comprising a core and having two sides (2) ~~with~~ each side comprising cooling elements ~~(3),~~

the electrophoresis combination chamber further comprising at least one inner gel plate and at least one outer gel plate, wherein the proximity of the inner gel plate and outer plate defines a space for casting gels and buffer reservoirs, and where ~~the~~ each cooling elements makes contact with an inner plate. ~~(3) are arranged between gel chambers (6, 7) and buffer vessels (8) formed on both sides of the core (2) by means of inner plates (4) and outer plates (5) in combination with~~ and further comprising removable ~~or switchable~~ isolating elements in the form of ~~a~~ hollow ~~seal~~seals that support the gels being cast. (9).

10. (Currently amended) Device according to Claim 9,

wherein

the cooling elements (3) are formed by means of a meander-shaped cooling labyrinth (10) with supply (11) and return (12) and the cooling labyrinth (19) encloses the buffer vessels (8) and (21), where the inner plates (4) ~~are made of a good~~ comprise an effective temperature-conducting material and the outer plates (5) are ~~made of a~~ transparent ~~material~~.

11. (Currently amended) Device according to Claim 9,

wherein

the inner plates (4) consist of ceramic or plastic material and the outer plates (5) of glass or transparent material, and the outer plates (5) are held in position by a clamping frame (13), and a cover (14) that covers ~~off~~ the top of the electrophoresis combination chamber (1) ~~in the upward direction.~~

12. (Currently amended) Device according to Claim 11, wherein

the clamping frame (13) is secured ~~on both sides~~ by means of clamping elements (15) and has viewing windows (16) for process inspection.

13. (Currently amended) Device according to Claim 9,

wherein

~~the lower limitation of~~ the electrophoresis combination chamber (1) is ~~realised by means of an~~ is in a fixed position on an adjustable ~~and~~ rotary table, ~~on which the electrophoresis combination chamber (1) is fixed positioned~~ and the cover (14) ~~indicates~~ comprises inlet and outlet lines for the cooling medium ~~as well as to the~~and buffer vessels (8, 21) ~~and~~, gel chambers (6, 7) and ~~the~~ connections for the electrodes ~~of the first and second dimension~~.

14. (Currently amended) Device according to Claim 9,

wherein

the core (2) ~~consists~~ comprises ~~of~~ a polymer material such as acryl glass, ceramic or plexiglass, ~~and the gel chambers (6,7) are joined with~~ filling tubes (17), ~~and~~ vent openings ~~are~~ located at the top of each side of the core, ~~arranged, and between inner plates (4) and outer plates~~ (5)a rectangular seal on each side of the core ~~seals are arranged~~, ~~and~~ recesses in the sides of the core for positioning the isolating elements. ~~(9) with recesses act together, and the parts of the electrophoresis combination chamber (1) contacting the media gels and/or gel solutions and/or buffer solutions are surface coated, where the surface coating can consist of amorphous carbon layers.~~

15. (Currently amended) ~~Device~~ A device for the two-dimensional separation of mixtures of biomolecules or other ~~substance~~ substances ~~mixtures~~, wherein the mixture comprises a gel, a

polymer composition, or a solution, ~~in gels, polymers or carrier free media~~ by means of electrophoresis in an electrophoresis apparatus,

wherein the electrophoresis apparatus comprises

~~all assembly groups as required for the performance of a two-dimensional separation area~~ fully integrated ~~in an~~ electrophoresis combination chamber (1), ~~consisting~~ comprising ~~of~~ a core having two sides, wherein each side comprises~~(2) with~~ cooling elements (3), wherein the cooling elements make contact with an inner gel plate, the inner gel plate being in proximity of an outer gel plate thereby defining a gel space for casting gels and adding buffer, ~~(3) are arranged between the separating chambers (6,7) formed on both sides of the core by means of inner plates (4) and outer plates (5) in combination~~and wherein the gel space may be further divided into segments by ~~with~~ removable ~~or switchable isolating~~ partitioning elements in the form of one or more ~~a~~ hollow seals (9), buffer vessels (8, 21) and holders for ~~the~~ electrodes, and ~~the performance of~~ the two-dimension ~~separation~~electrophoresis ~~can~~ may be ~~fully~~ automated. ~~without the necessity of manipulation on the gels themselves during the course of the two-dimension separation.~~

16. (Currently amended) Combination chamber for two-dimension separation of mixtures of biomolecules or other substance ~~mixtures~~ by means of electrophoresis in horizontal gels arranged ~~horizontally and~~ above each other ~~by means of electrophoresis~~ with a rear wall plate (28A) and a cover plate (28B), where at least two deflection elements (22) are arranged between rear wall plate (28A) and cover plate (28B) for guiding isolating elements in the form of a hollow seal (24).

17. (Currently amended) Combination chamber according to Claim 16,

wherein

the chamber ~~arrangement consists~~ comprises ~~of~~ an upper ~~IEF~~-part for the performance of the IEF-electrophoresis in the first dimension and a lower part for the performance of the SDS-electrophoresis in the second dimension, ~~and the gels (25) and (36) are arranged horizontally above each other,~~ and the plates (28A, 28B) are sealed off to the outside by means of seals

positioned in between the plates, wherein the seals extend along the length of the plates, ~~(23), the configuration of the seals (23) and the thickness of the gels (25, 36) being fixed and, next to the deflection elements (22),~~ electrodes ~~(26, 27) are positioned~~ for ~~the~~ electrophoresis ~~of~~ in the first dimension, and ~~where~~ wherein the rear wall plate (28A) is made of ceramic or glass and the cover plate (28B) is a transparent plate.

18. (Currently amended) Combination chamber according to Claim 16,

wherein

the rear wall plate (28A) forms ~~a unit together with the~~ an upper reservoir comprising a buffer ~~reservoir (29) of~~ for electrophoresis in the second dimension and ~~as well as the~~ a pouring vessel for casting the gel of the second dimension(30), ~~and the~~ a buffer filling vessel for adding a lower reservoir buffer for the second dimension(31), ~~and the~~ an assembly ~~assembled construction consisting~~ comprising ~~of~~ the plates (28A, 28B) and the upper buffer reservoir (29), the pouring vessel (30) and the buffer filling vessel (31) ~~is~~ being positioned ~~placed and arranged~~ in the lower buffer tank (32), and a removable seal positioned between the plates and at the bottom the plates and further, extends the width of the plates, and electrodes in contact with the upper and lower reservoir buffers. ~~(33) is arranged, which is liftable in function, and in the upper buffer reservoir (29) and in the lower buffer tank (32) electrodes (38, 39) are arranged for the electrophoresis of the second dimension~~.

19. (Currently amended) Method for the two-dimension separation of mixtures of biomolecules or other ~~substance~~ substances ~~mixtures~~, wherein the mixtures comprise ~~in gels~~a gel, a ~~or~~ polymer ~~carriers~~ or a solution by means of electrophoresis in an electrophoresis combination chamber, where

- arranging an IEF-gel ~~is arranged~~ horizontally in the combination chamber ~~and is coated over~~ with a re-hydration buffer ~~for re-hydration purposes~~,

- ~~following this,~~adding the mixture of ~~a biomolecule~~ biomolecules or other ~~or substance mixture specimen is brought~~ into the IEF-gel or applied to the IEF-gel and the electrophoresis of the first dimension is performed,

- ~~before, after or during the performance of the first dimension,~~casting a horizontal ~~an~~ SDS-gel for ~~the performance~~ of the second dimension ~~is brought in horizontally to the~~ below and in proximity to the IEF-gel, wherein the SDS-gel and IEF-gel are ~~and, isolated from this~~ separated by a hollow seal~~, into the combination chamber and the SDS-gel is polymerised~~,

- removing the hollow seal after completion of the IEF-electrophoresis ~~the isolation is neutralised,~~ and pouring a contact gel ~~put in to~~into the space formerly occupied by the hollow seal, ~~resulting spaces, buffer solution added~~

performing the SDS-electrophoresis in the second dimension ~~is carried out, and finally the gels are developed and coloured according to the known methods~~ and

terminating the electrophoresis in the second dimension, and developing the gel to identify the positions of the biomolecules or other substances.

20. (Currently amended) Method according to Claim 19,

wherein

after the re-hydration of the IEF-gel, excess buffer solution is removed and the recess in the IEF-gel is produced by the introduction of a spacer during the re-hydration, and ~~the IEF-gel is re-buffered after the~~ IEFelectrophoresis the IEF-gel is contacted with ~~by adding~~a re-equilibration buffer, and ~~the isolation is neutralised by the~~the hollow seal is removed ~~removal of a plastic hose~~ by drawing it out ~~with the help of~~by a stepping motor.

21. (Currently amended) Method according to Claim 19,

wherein

the ~~cooling~~ gels of both electrophoresis-dimensions are cooled by immersion ~~is performed by immersing the gel sandwiches in~~ thermostatically controlled buffer solution of the second dimension, or alternatively, the buffers and gels are cooled ~~cooling of both electrophoresis-dimensions is realised by cooling chambers~~by the cooling elements ~~arranged~~ in the core of the combination chamber.

22. (Currently amended) Method according to Claim 19, wherein

the mixture of biomolecules or other substances biomolecule ~~or substance mixture specimen~~ is ~~brought~~ placed into a recess in the IEF-gel.

23. (Currently amended) Method for the one-dimension separation of mixtures of biomolecules or other ~~substance~~ substances ~~mixtures~~ by means of electrophoresis, comprising the steps,

- ~~instead of the gel for the separation in the first dimension as well as the isolating element,~~ preparing a gel by casting the gel with a gel solution;

inserting into the gel solution a comb wherein the comb comprises teeth, each of which forming a recess or well ~~with specimen pockets for various specimens is placed in the SDS gel and this is polymerised out~~ in the polymerized gel,

- removing the comb ~~is removed~~ after ~~out~~ polymerisation has completed,

- adding an amount of the mixture of biomolecules or other substances~~the specimens are brought~~ into the ~~resulting recesses~~the recess or well and

- performing electrophoresis ~~following this, the~~in one-dimension ~~electrophoresis is performed~~.

24. (Currently amended) ~~Hydrated~~ A hydrated IEF-gel ~~manufactured~~ prepared by pouring an immobiline gel solution of ~~with~~ low pK on a gel-polymerised ~~foil and its polymerisation~~allowing polymerization to ensue, pouring of an acryl-amide gel solution on the immobiline gel and ~~incipient polymerisation~~allowing polymerization to ensue, pouring of an immobiline gel solution of ~~with~~ high pK on the acryl-amide gel and ~~its on polymerisation~~allow polymerization to ensue, and subsequent re-hydration ~~by means of~~with a re-hydration buffer, ~~which contains~~comprising 1-4% of ~~such~~ ampholines, ~~allowing~~ yielding a pH-range within 2-11.

25. (Currently amended) IEF-gel according to Claim 24, wherein

the immobiline ~~gels are manufactured~~ comprise from 6-10% wt-volume of acrylamide and ~~, preferentially 10%, acrylamide with additive of~~ 50-200 mM ~~, preferentially 50-100 mM~~ immobiline.

26. (Currently amended) IEF-gel according to Claim 24, wherein

the acrylamide gel is manufactured from ~~3,5-4,5%~~ 3.5 – 5.0% wt.-vol. of ~~preferentially 3,5-5%~~ acrylamide.

27. (Previously presented) IEF-gel according to Claim 24, wherein

the re-hydration buffer contains ~~of 5-9,5 M~~ 5.0 – 9.5M, ~~preferentially 8 M,~~ urea and, ~~as required~~optionally, detergents, ~~preferentially~~ selected from the group consisting of Tween 20, Chaps ~~or~~ and Triton X-100.

28. (Currently amended) IEF-gel according to Claim 24, wherein

before re-hydration, washing steps are carried out as required, and the gel is dried.

29. (Currently amended) A dry ~~Dry~~ gel manufactured by pouring an immobiline gel solution of ~~with~~ low pK on a gel polymerisation foil and ~~its~~ allowing polymerisation, pouring of an acrylamide gel solution on the immobiline gel and its allowing ~~incipient~~ polymerisation, pouring of an immobiline-containing gel solution of ~~with~~ high pK on the acrylamide gel and ~~its incipient~~allowing polymerisation.

30. (New) The IEF-gel according to Claim 26, wherein
the acrylamide gel is from 3.5-4.5 wt.-vol% acrylamide.

31. (New) The IEF-gel according to Claim 27 wherein the re-hydration buffer contains 9M urea.

32. (New) The method of claim 1, wherein the first gel is a preformed gel that is placed between the inner and outer plates, and rehydrated.